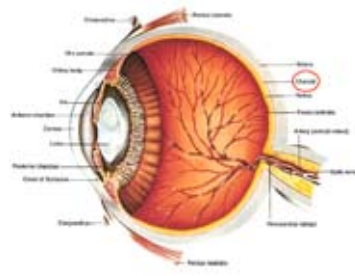


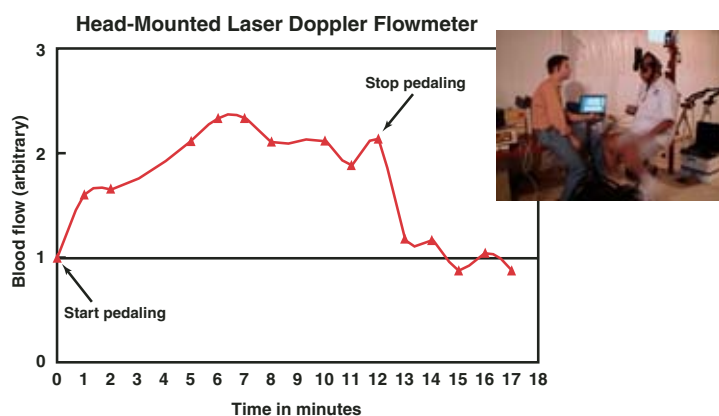
Noninvasive Choroidal Blood Flow Measurements in a Reduced Gravity Environment Using Laser Doppler Flowmetry

KC-135 LDF Measurements

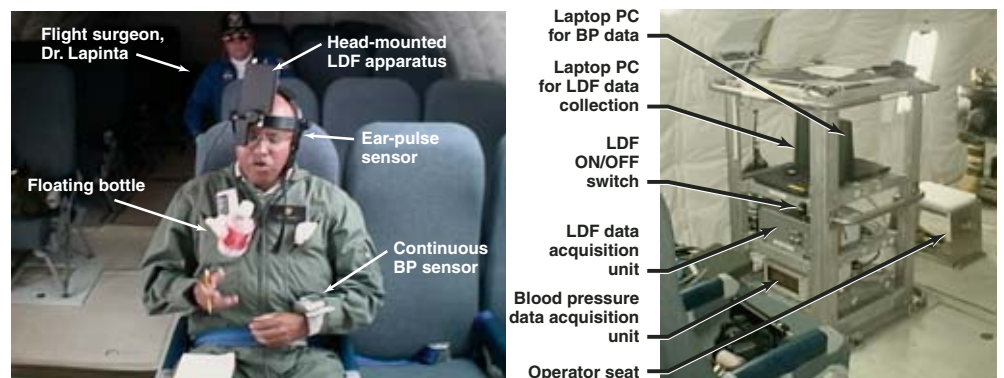


A significant number of astronauts report changes in visual acuity (VA) during orbital flight. To date this remains of unknown etiology. Primarily, could choroidal engorgement mechanism and secondarily some curvature/shape-change mechanism of the cornea or lens be responsible for this change in VA? Since the choroid has no baroreceptors to autoregulate the choroid during fluid shifts as does the systemic vascular system, the choroid possibly remains engorged thereby pushing the macula forward, causing a hyperopic shift of the eye. Our experiments onboard the KC-135 could help answer this question and facilitate planning for long-duration missions.

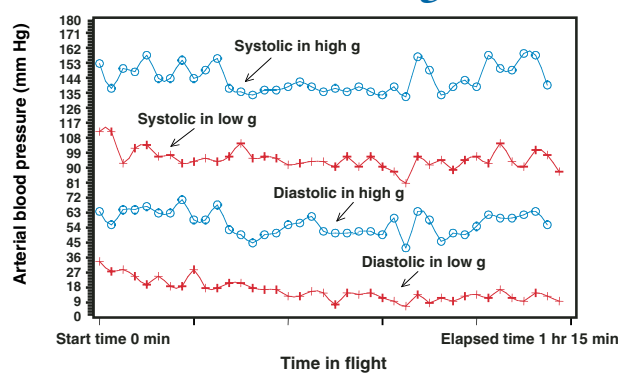
Ocular Blood Flow During Biking



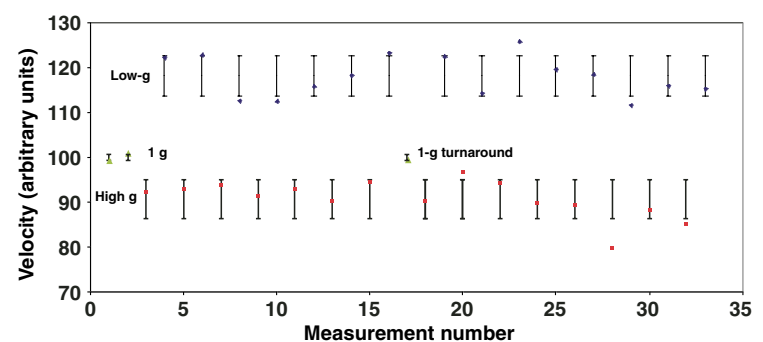
Ocular Blood Flow Monitoring in 0 g in a Test Subject (RRA) Onboard the KC-135 Airplane



Arterial Blood Pressure Measurements in Parabolic Flight



Velocity Data With ± 1 Standard Deviation Error Bars From Two Consecutive Parabolic Flight Sets



LDF Assembly



Here on Earth LDF Can Be Used for the Early Detection of AMD (Age Related Macular Degeneration)

AMD damages and destroys the central vision of up to 1 in 3 Americans in their lifetime and has no known cause or cure.



By the year 2025 the population of people over the age of 65 in the U.S. will be 6 times higher than in 1990. AMD will soon take on aspects of an epidemic.

(Carl Kupfer, MD, Director HEI/NIH)